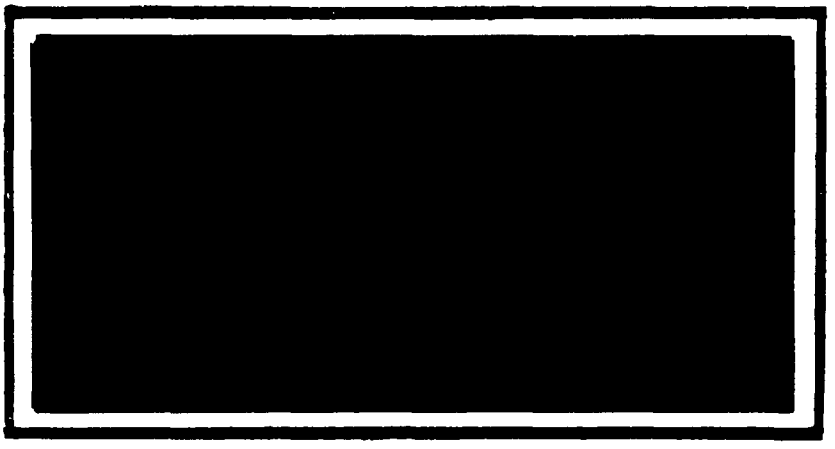

DEPARTMENT OF THE AIR FORCE

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(2)

INFORMATIONAL REQUIREMENTS FOR THE FUELS AUTOMATED MANAGEMENT SYSTEM (FAMS-C) AT THE MAJOR COMMAND LEVEL

THESIS

Gregory K. Bergstrom, Captain, USAF

AFIT/GLM/LSM/90S-3

The opinions and conclusions in this paper are those of the author and are not intended to represent the official position of the DOD, USAF, or any other government agency.

AFIT/GLM/LSM/90S-3

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THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

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Captain, USAF

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Preface

The purpose of this study was to determine the information requirements for the major commands Fuels Automated Management System. The information developed is to be used in designing this fuels management information system. The requirement were developed from interviews with individuals at the Standard Systems Center's (SSC) Fuels Automated Management Systems program office and individuals at selected MAJCOM Fuels Offices.

The study was successful in developing a requirements list due to the help of many individuals. First , I wish to extend thanks to my thesis advisor, Captain John E. Sullivan, III. He was always there, ready to help with suggestions and guidance on how to continue this study. Second, the following people, knowledgeable in major command fuel information requirements, made this study possible. They are Capt Ernest Nickols and Tsgt Jim Polum, SAC; Capt Douglas Wahl and Mr. Joseph Mallow, MAC; Capt Paul Mann and Mr. Clifton Heath, TAC; SMSgt Ramon Lopez, ATC, and Capt Karl M. Overman, CMSgt Bruce Wilber, Msgt Don Frioux, SSC. These individuals were willing to be interviewed in-depth on the needs of a MAJCOM Fuels Office. Again, thanks for the inputs. Finally, I wish to thank my wife, Supattra, for her understanding and support throughout this study.

Gregory K. Bergstrom

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Abstract

This study investigated the informational requirements for the Fuels Automated Management System - Command Level (FAMS-C). The areas of interest were: desired capabilities of the management information system (MIS), the specific data required to establish and maintain a current data base, what associated MIS access should be pursued, and the best mode for primary and secondary data transmission. Surveys (personal and telephone interviews) were conducted with individuals from the Standard Systems Centers (SSC) Fuels Management Office and personnel at the following MAJCOM Fuels Offices: SAC, TAC, MAC, ATC, and AFLC. The information gathered during the interviews was developed into an initial requirements list. This list was validated against the requirements identified at the Fuels Automated Management Systems - Command Level (FAMS-C) workshop held at SSC/SMSM in May 1990. Items identified in the initial survey were also identified during the workshop, however the workshop did not go into as great a detail as this report.

INFORMATIONAL REQUIREMENTS FOR THE FUELS AUTOMATED MANAGEMENT SYSTEM (FAMS-C) AT THE MAJOR COMMAND LEVEL

I. Introduction

Overview

The Fuels Automated Management System - Command Level (FAMS-C) is being designed as a current state-of-the-art management information system. This chapter describes, in brief, a management information system, what its general characteristics are, and how it may improve a managers decision process. Next, justification of the research and the problem statement is explained. This chapter concludes with the limitations, assumptions and investigative questions.

Management Information Systems

There is no one central theory on what constitutes a management information system (MIS). However, the MIS field, in general, is concerned with the effective use of information technology in an organization (17:17). Henry C. Lucas, a leading MIS researcher, describes a MIS as "a set of organized procedures that, when executed, provides information to support decision making and control in an organization" (17:10). Researcher and author David Kroenke states:

> A MIS is the development and use of effective information systems in organizations. A MIS is effective if it facilitates the goals of the people and organizations that use it. (17:6)

According to George Reynolds, a management information system consultant, a MIS is:

> A special class of information system whose components are people, procedures, and equipment that work interdependently under some means of control to process data and provide information to users. (25:16)

One or more transaction processing systems normally form the database for a MIS. A MIS brings together separate tasks and information; then coordinates those tasks to achieve one or more objectives of an organization (15:37). One function of a MIS is to provide summaries of large amounts of information to help managers make decisions. A correctly designed MIS improves the efficiency of managers and the effectiveness of their decisions.

A definition of the term "information" is critical to the understanding a MIS. An information system is not just data, nor is it just a computer software program. An information system takes raw data and transforms it into a tangible entity that serves to reduce uncertainty about some state or event (17:11). Data is defined as recorded facts or figures and becomes information when processed into a useable format (15:14). A MIS is an information system that has been specifically designed to provide pertinent, timely, and accurate information to reduce uncertainly in managerial decision making (15:18).

Currently, management information systems are being designed using fourth-generation computer programming languages. George Reynolds defines a fourth-generation programming language as:

> A non-procedural language that uses English-like commands. These languages are easy to learn, even for managers and other people who have not been trained in computer technology. It is also highly productive, requiring fewer lines of instructions (code). (25:295)

Most programs written in fourth-generation languages are designed in modules, each module (section) performing a specific function, yet able to access information from other modules. A manager can work with only one section of the program, such as report generation, and he will not effect other parts of the program. Most fourth-generation MIS programs include database managers, report request generators, financial modeling, graphics, and statistics models (25:297). With a MIS written in a fourth-generation language, a manager, using English-like commands, can generate programs to provide required information in a variety of formats.

MAJCOM Fuels Offices use large amounts of fuels data daily. However, these offices require excessive time and manpower to gather this data as it has not been organized into an MIS.

Justification of Study

Fuel and fuel products are a significant portion of the Air Force budget, averaging over $3 billion for the past

five years (6:1). Fuel is a high cost, critical item used daily throughout the Air Force. The current management procedures are paperwork intensive and have changed little in the last twenty years. With the advent of microcomputer technologies and their associated applications in the fuels environment, the Fuels Automated Management System (FAMS) program was conceived. The Director of Maintenance and Supply, HQ USAF/LEY directed the development and implementation of the $88 million FAMS program (6:12). FAMS will be a computerized management information system and will use microcomputers and associated technology to significantly improve fuel support operations at three levels of command: Air Force, major command, and Wing. FAMS-B (Wing level) has been developed and is undergoing testing and implementation. FAMS-C (MAJCOM level) is the intermediate segment of the system and it will consolidate fuels acquisition, distribution, and consumption data (6:5). FAMS-A (Air Force) level will support the Air Force resources management information system for the integration of inventory and financial records. Programming, budgeting, acquisition, and preparation of the annual AF fuels budget will be accomplished using FAMS-A (6:5).

When developed, FAMS-C will stratify Combat Fuels Management Sy tem information for use by senior operational planners. Planners will use FAMS-C to provide accurate capability assessments through the Joint Reporting Structure, enhancing war-fighting effectiveness. A program

memorandum directive (PMD) has been developed and approved for FAMS, but little progress has been made in developing FAMS at the Air Force and MAJCOM levels. This study will identify informational requirements necessary to continue the implementation of FAMS at the MAJCOM level.

Problem Statement

The Air Force fuels community has not defined the informational requirements for FAMS-C. What information is required for MAJCOM Fuels Offices to perform their duties efficiently and effectively?

Investigative Questions

This research was conducted to identify required information and flow routing to formulate a FAMS-C MIS. The following questions provided critical data to be used in construction of a computer program to support FAMS-C.

1. What capabilities do MAJCOM fuels personnel desire in a computer based MIS?

2. What associated MIS access should be pursued?

3. What specific data is required for the FAMS-C data base?

4. What medium of data transmission should be used and how often will FAMS-C be updated?

Scope

The scope of this research was limited to the Air Force Standard Systems Center's (SSC) FAMS program office and to five Air Force Major Commands; the Strategic Air Command (SAC), the Tactical Air Command (TAC), the Military Airlift

Command (MAC), the Air Force Logistics Command (AFLC) and Air Training Command (ATC). My ability to perform research was limited by time and money. These five commands were considered to be representative of Air Force wide requirements. Also, the FAMS program office, which works with all Air Force MAJCOM Fuels Offices, could provide me with an Air Force wide overview of unique requirements. Interviews were limited to officials of the preceding five commands, who work in the MAJCOM Fuels Offices. The MAJCOM Fuels Offices are the primary users of base level fuels information. Informational requirements for non-Air Force activities, (i.e. DOD and the Defense Fuels Supply Center,) was not considered as FAMS is unique to the Air Force.

Assumptions

1. A MIS will improve the physical and monetary management of fuel throughout the Air Force

2. Representatives at each MAJCOMs Fuels Office have sufficient knowledge to answer questions on fuels information requirements on behalf of their command

3. Interviews contain a minimum of bias and the interviews were objectively conducted

Summary

A Management Information System, which generally consists of a specialized information system, was described. The increased effectiveness and efficiency of an organization, with a good MIS, were highlighted. Next, the use of a fourth-generation computer programming language, which makes programming easier for individual managers, was

defined. The purpose of FAMS and the need for this research was then explained. HQ USAF/LEY's interest in improving the current system, by implementing FAMS, was expressed along with the limitations and assumptions that effected this research effort. Finally, the specific investigative questions were stated.

II. Literature Review

Overview

This chapter presents a synopsis of the current fuels data reporting system and the status of the initiatives (FAMS) to improve the timeliness, accuracy and usefulness of available fuels information.

Current Fuels Management System

The forms and techniques used to accomplish base level fuels data documentation and transactions have not significantly changed in the last twenty years (13:1-2,11:1,22). Two noted improvements have taken place. The first was the elimination of keypunch (computer) input cards, approximately 7 years ago, which was replaced with a remote data input terminal. The second improvement was the introduction of personal computers into the base fuels branch, especially the fuels accounting section. These changes have increased the timeliness of fuel data inputs and have been effective in maintaining an updated base level fuels data base and subsequent reporting by the base level fuels data base (13:9-10).

However, the methods used to transmit base level fuels information to the major commands has changed little. And, over the years, major command fuels offices (LGSF) have been assigned additional tasks that require up-to-date

information. The reports being provided to the MAJCOM Fuels Office, by the base level fuels branch, have become insufficient or not available when needed. The base to MAJCOM reporting system has not been updated to keep pace with the informational requirements of the MAJCOM Fuels Office (22). An example, is the need of the MAJCOM Fuels Office to integrate operational support/capability information on petroleum resources to support the implementation of an operational plan (6:5). The ability to know what facilities and equipment are available, and the quantity and type of fuel available, is critical in today's environment.

Type of Reports

Computer Generated Reports. There are two fuel specific reports generated by the Standard Base Supply System (SBSS) computer based on data input by the base fuels branch. First is the daily Combat Fuels Management System (CFMS) (RCS: HAF-LEY(M&D)8201) report, also referred to as the D33 report. It is currently the only daily recurring report sent to the MAJCOM Fuels Offices (1:1-1). The second report is the Monthly Fuels Management Data Report (RCS: LOG-LO(M)7321), commonly referred to as the M34 report. This is the only recurring monthly fuels report sent to MAJCOM Fuels Office (4:5-481). The MAJCOM Fuels Offices make management decisions based on the unique information contained within these reports.

The CFMS report is generated daily from the SSBS fuels data base. "The purpose of the base level program is to produce the Combat Fuels Management System (CFMS) report files for transmission to applicable major commands" (4:51). Within the past year, the reporting procedures have been upgraded from punch cards to on-line processing of the source data (2:1-1). Currently the CFMS report is forwarded to the appropriate MAJCOM from the SSBS computer, via the AUTODIN system, to the Worldwide Military Command and Control System (WWMCCS) classified computer data base.

The CFMS report is broken into six separate categories:

1. Inventory Data
2. Fuels Mobility Support Equipment
3. Mobile Equipment
4. Fixed Facilities
5. Capabilities
6. Remarks

> The system comprises three functions; (1) edit and update programs, (2) data transfer program, and (3) management products. (1:1-1,2:30-2)

The information provided by the CFMS report is used by major command fuels offices and HQ USAF/LEXX and LEYSF planners for making supportability and capability assessments. It can provide data to determine whether existing petroleum assets and capabilities can support war plans or whether additional assets may be required (10:1). Because of the importance of the information within the CFMS report, it will be transmitted over the AUTODIN system

during times of minimize (operational essential message traffic only) (4:5-25).

The drawback to the current routing of the unclassified CFMS report is it is sent directly into the WWMCCS classified data base at MAJCOM. The CFMS data then has to be extracted from the WWMCCS data base, declassified, and forwarded through base distribution to the MAJCOM Fuels Office. The process of getting a copy of the unclassified daily CFMS report to LGSF takes 3 or more days (19,20,21).

The M34 is a monthly report produced from the SBSS computer fuels data base. It is sent to the MAJCOM Fuels Office, by the base fuels branch, no later than the 10th workday of each month. This report may be sent via AUTODIN or by mail. The MAJCOM Fuels Office specifies how each base will forward a copy of the M34 (5:1-162). The report, using either method, usually does not arrive at the MAJCOM Fuels Office until the 15th of the month or later. The delay is do to the base not sending it early enough in the month and delays in the Air Force distribution system (20,26). Also the information on the M34 is not considered important enough to transmit over AUTODIN during period of minimize (5:5-23). The data provided by this report, is generally useful for historical proposes only.

The purpose of the M34 is:

> To provide cumulative totals for issues, defuels, receipts, shipments, inventory adjustments, and identity changes. In addition, stock position data are provided for each stock number loaded in type stock record account code P. Source

> Identification and Ordering Authorization (SIOATH) data is provided on a monthly basis for management and surveillance of the fuels account. (4:5-480)

The SIOATH is used by DFSC to advise bases supplied by DFSC aviation fuel (avfuel) contracts of their source and authorized resupply quantity. It is also used to indicate source of supply and authorized quantities (5:1-13).

Within the M34 report, refuels (the filling of an aircraft with fuel) and defuels (removal of fuel from an aircraft) are broken down by type and customer, i.e., Air Force, Army, Navy, Marines, or commercial contract. Ground fuels (fuels used to support equipment or facilities other than aircraft), unleaded gasoline and diesel fuel, are broken down into three supported categories: vehicles, aircraft ground support equipment, and heating fuel. Each MAJCOM Fuels Office is responsible for tracking the quantities and types of fuel used (5:1-162). The information on the M34 would be of more use if it was readily available when needed.

Manually Prepared Reports. The base fuels officer also submits a manually prepared report monthly on missile propellants using AF Form 588, "Missile Propellants Consolidation and Reporting of Sales" (5:4-43). Missile propellants are such items as Helium, Argon, Hydrazine, Hydrogen, Neon and Nitrogen Tetroxide (5:4-32). The base fuels officer consolidates all of the transactions for the month by type product and user. The MAJCOM uses this

information to manage funds for the programs or projects that are using the product (5:4-42).

Another report, such as an inventory transaction report may also be required (5:4-43). These reports are sent by mail to higher headquarters.

The base fuels branch also sends several annual reports to the MAJCOM Fuels Office. The first of these manually prepared reports is the Peace Time Operating Stock Computation for Aviation Fuel (Form AF 761) report. This reports contains the computations on projected requirements for aviation fuel for the coming year (5:1-55). The information to prepare the AF Form 761 is drawn from the local Base Fuels Accounting Office's computer data base. The MAJCOM Fuels Office personnel validate the information furnished on the form against data they have extracted from monthly M34 reports. They check for errors and then manually consolidates all the individual base requirements into one requirement for the command. The consolidated report is sent to Det 29, San Antonio Air Logistic Center (SA-ALC)/SFML (5:1-32). Det 29, SA-ALC/SFM is the Air Force agency responsible for interfacing Air Force requirements with the Defense Fuel Supply Center.

> Det 29, SA-ALC. A detachment of the Directorate of Energy Management (responsible for overall management of the fuels division, AF stock fund). Det 29 is located at Cameron Station, Alexandria, VA 22314. Det 29 performs centralized commodity management for items managed in the bulk petroleum fuels management category, fuels division, AF stock fund. (5:1-12)

They work closely with the Defense Fuel Supply Center to insure the Air Force has the correct type and quantity of fuel to meet our requirements.

The second manually prepared report is the Bulk Fuels Storage Computation (AF Form 759) report. This report contains the capacity (size) of all assigned fuel tanks and the type fuel stored in them. Also projected changes in tankage configurations are input on this report (5:1-54). The MAJCOM Fuels Office validates this report against last year's report and updates what has occurred at the reporting base. The MAJCOM Fuels Office consolidates all reporting base's information and then sends the consolidated report to Det 29, SA-ALC/SFML (5:1-32). The individual base AF Form 759 is filed in an active file for one year and in an inactive files for 3 years. The AF Form 759 is used frequently for reference information.

The third report is the Worldwide Requirements - Ground Fuels (Automotive, Diesel, Fuel oil and Kerosene) (RCS: LOG-SA(AR)7144). The base fuels officer submits this report to the MAJCOM Fuels Office for review, approval and submission to Det 29, SA-ALC/SFM (5:1-35).

Non-Standard Reports. The base fuels officer also provides many non-standard reports to MAJCOM Fuels Office. These range from the current level of prepositioned war reserve materiel stock (PWRMS) to the ability of the base fuels branch to meet the projected maximum one-day requirements for aviation fuel. Other reports range from

special experience identifiers for personnel to the status of Civil Engineering job orders. Anything that limits the ability of the base fuels branch is reported to the MAJCOM Fuels Office (14,24,26,27).

The above reports are described to show what type of information is currently sent and how the information is sent to the MAJCOM Fuels Office. Except for the M34 and D33, the information needed for these reports is extracted from the base fuels computer and mailed to the MAJCOM Fuels Office. The MAJCOM Fuels Office compiles the information from the individual reports on to master form and sends it to Det 29 or the appropriate agency.

MAJCOM Fuels Offices also gather information from several other sources. Information is extracted from reports generated at base level and sent to their respective data bases at MAJCOM. This base level data is contained in several computer systems. Two of the specific systems are the Standard Base Supply System computer data base and the Advanced Data Personnel System's computer data base. Also, information is consolidated and forwarded from several of the base comptroller computer sub-systems. The information is accessed, at the MAJCOM level, after it has been consolidated in various computer data bases at MAJCOM level. Although the computer systems, at base and MAJCOM level have been upgraded over the years, the inputs and outputs reflecting fuels information has changed little in the past twenty years. It is difficult to extract needed information

from these data bases in a usable form and in a timely manner.

MAJCOM Fuels Offices also gathered information through phone calls and messages to various sources that range from the base fuels officer to SA-ALC/SF and the Defense Logistics Agency (12,19,20,27).

Associated Programs

Major command fuels require base level information to accurately track fuel usage within the command, the status of fuels mobile equipment (refueler trucks, hose-carts) and fixed facility refueling systems (hot and/or cold pits). They need the information to forecast and justify future fuel requirements, integrate operational support and capability information, and provide accurate peace-time and war-time capability through the Joint Reporting Structure (6:4).

The required information will be available from several associated data bases, such as FAMS-B, Air Force Command and Control System (AFC2S), FAMS-A, Defense Fuels Automated Management System (DFAMS), and the Automated Air Facilities Information File (AAFIF) (20,21,26).

FAMS-B. FAMS-B is the base level portion of the FAMS program. It is a program to automate many of the fuel tasks performed at base level, increase safety, improve accountability and inventory control, and, when fully operational, reduce required manpower.

FAMS-B consists of creating a central data base of all base fuels information on a micro-computer in the base fuels branch. When fully implemented, the following four areas will be making inputs into this data base.

1. Automated tank gaging (very accurate inventories)
    a. Monitors the level, temperature, and water
    b. Detects leaks and verifies receipts
2. Automated fuels service station
    a. Accurate and timely transaction data
    b. No attendant required
3. Automated transactions between aircraft and refueler/servicing point
    a. Accurate billing information
    b. Eliminates three transcriptions of the transaction data
4. Inputs from all fuels branch functional areas
    a. Accounting & Administration
    b. Quality Control, Storage and Cryogenics
    d. Operations and Fuels Control Center
    e. Training and Mobility (9:48-66)

Figure 1., Fuels Automated Management System - Base Level, is a graphic description of the information flow within the base fuels branch. FAMS-B will also be furnishing information to and receiving information from FAMS-C and other computer data bases. For additional information on FAMS-B see AFIT thesis 88S-20, Project PETROL RAM: Improving the Management of Air Force Fuels Operations and Inventories, by Phillip R. Frederick.

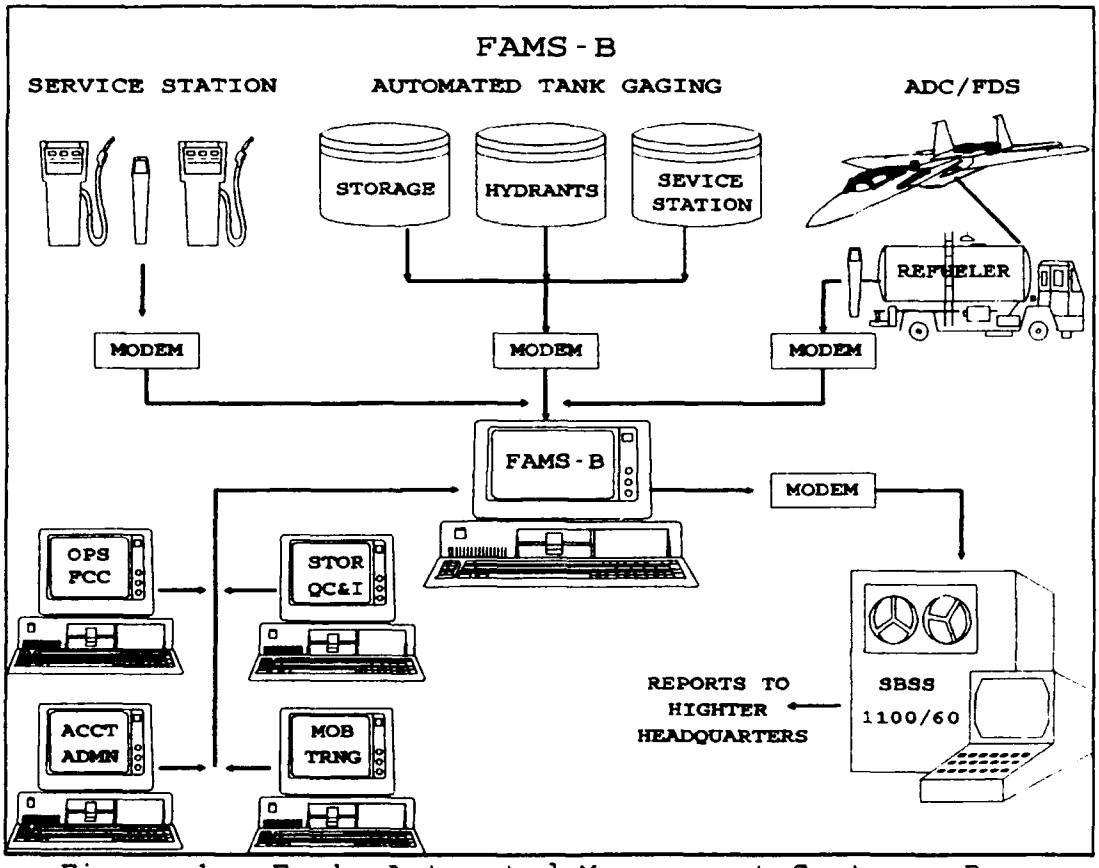


Figure 1. Fuels Automated Management System - Base Level (9:72)

AFC2S. AFC2S is an Air Force wide program to modernize the current Air Force standard and command-unique C2 systems. AFC2S will have a specific fuels module to support capability assessment related data. AFC2S will integrate the Air Force command-unique systems with the Worldwide Information System (WIS) and acquire hardware, software, and telecommunications to support Air Force command and control systems (10:1).

> The AFC2S program is a high priority program that will modernize 12 Air Force standard and up to 92 major command-unique command and control systems

> that currently process on the Honeywell 600/DPS series of computers at Air Force major command locations. The AFC2S procured hardware and software will be integrated with the Worldwide Military Command and Control System (WWMCCS)/Joint Worldwide Information System (JWIS) procured hardware and software. When combined with the JWIS modernization program, the AFC2S program will correct major weaknesses in our conventional warfare planning and execution process. These improvements will apply to the full range of Air Force C2 functions such as force capability, air operations, air refueling, airlift and deployment, mobilization, reconnaissance, intelligence, manpower, logistics, and munitions, and communications. (10:1)

The AFC2S program, when fully implemented, will provide up-to-date information to the MAJCOM Fuels Office in a real-time mode. FAMS-B and AFC2S will improve the accuracy and timeliness of fuels data that is required daily. FAMS-A, on the other hand, will be a system for consolidating fuels data for historical purposes.

FAMS-A. FAMS-A will be a centralized data base which the MAJCOM Fuels Office can inquire for historical data. Some of the information that will be available in this data base is consumption summaries for all Air Force locations; to included type fuel, quantity of fuel and customers. Summaries for current fuels contracts will be available by location and type. Also product receipts, shipments, and quality information from Aerospace Fuels Laboratories will be available (4:5,18:3).

DFAMS. An interface with DFAMS will allow the MAJCOM Fuels Office to monitor the fuel sources available to both the wholesale system terminals and to USAF bases when

fuel is provided directly to the base. Complete contractual information between DFSC and the commercial companies will also be available (18:12).

AAFIF. AAFIF is a data base maintained by the Defense Mapping Agency. The AAFIF contains detailed data on air facilities at over 43000 airports. The standard format includes a significant number of data inputs on fuel facilities. MAJCOM Fuels Offices would use this information when planning deployments of forces (18:13).

Summary

The first portion of this chapter presented a review of the current reporting procedures and how MAJCOM Fuels Offices gather data. The second portion described, in general terms, some of the associated computer data bases that will interface with FAMS-C. The methodology used to perform my research is explained in the next chapter.

III. Methodology

Overview

This chapter discusses the population of concern, why a survey data collection method was chosen, and how the interviews (a type of survey) were performed.

Population

The population, of concern, was all MAJCOM Fuels Offices Air Force wide. However, a representative sample population, consisting of the Fuels Offices at MAC, SAC, TAC ATC and AFLC was surveyed. In addition, three experienced fuels individuals working at the Standard Systems Center in the Fuels Automation Management System Office (SSC/SMSM), were interviewed. The requirements of these five commands, when combined with those of the SSC/SMSM, provided a comprehensive list of standard requirements for the entire Air Force. The requirements list also indicated the need for the ability to add command unique information to the reports. The research was limited to three individuals at the SSC/SMSM and eight experienced fuels personnel at MAJCOM level. These people were chosen because of the following:

1. They are the people who currently use available fuels information.

2. They are experts in the fuels management arena.

3. They know what information the current system does or does not provide.

4. Through experience they identified:

a. Information redundancies.

b. Information short falls.

c. Formats that hinder the use of the information

The researcher, after clarifying and consolidating the data collected during the interviews, validated the information against a consolidated listing of all MAJCOM and separate operating agencies fuel information requirements contained in the FAMS-C workshop minutes.

Survey

The researcher chose the survey methodology to develop the data for several reasons. First, C.W. Emory, a researcher and noted author on research techniques, considers surveying as a major data gathering method (7:158). Emory also stated:

> The great strength of questioning (surveying) as a data collecting technique is its versatility. Indeed, abstract information of all types can be gathered only by questioning others. (7:158)

Surveying is also appropriate in conditions that indicate the respondents are uniquely qualified to provide the desired information. A survey may consist of either a questionnaire or interview. A survey may be performed by mailing a questionnaire to a sample population or interviewing people over the telephone. Finally, a survey is more efficient and economical than direct observation (7:158-159; 8:13-14).

For this research to be effective, what type of survey should be accomplished? The required information is very

specific, however interaction with the respondent may be required for clarification. The population being surveyed is limited, so a high response rate is required for a valid requirements list. The time and funds required to perform personal interviews are limited. Mail surveys do not allow for interaction with the interviewee and response rates are generally low (7:172, 23:95-96). Also, developing a quality mail survey to gather the required information would be difficult and approval would be very time consuming. A telephone survey is low cost, allows for interaction with respondents, and requires less time and travel (7:169). The preceding reasons justify using the telephone survey technique as the primary means to gather information.

Interviews. To augment the MAJCOM phone interviews, the researcher first performed personal interviews with the three individuals at the SSC/SMSM. These interviews, along with historical information available in their files, provided a solid base for the telephone interviews with the individuals at the MAJCOM Fuels Offices.

The researcher accomplished a total of eight telephone interviews. He interviewed experienced MAJCOM fuels personnel at MAC, SAC, TAC, ATC, and AFLC Fuels Offices. These people use base level fuels information to effectively monitor fuel consumption and accounting information for their commands. The base level information is also used to track the availability of qualified fuel specialists, operational fuel serving equipment, and the fuel quality.

The inputs from these five commands and the SSC/SMSM were used in conjunction with AFR 144-1; AFR 67-1, Vol I, Part Three; AFR 67-1, Vol II, Part Two; AFM 67-413; and AFM 67-825 to develop the informational requirements for a FAMS-C MIS model. These requirements are generic for use throughout the Air Force.

The personnel interviewed were identified by position and years of experience at a MAJCOM Fuels Office. The survey questions, which are located in Appendix A, asked the respondents to explain what information they needed to efficiently perform their job. Also, in what format and how often was the information required to maximize its usefulness. The MAJCOM uses the information to monitor command wide fuels operations and prepare consolidated reports for high headquarters. The questions were developed from the literature review of the current reporting system and the FAMS program to date.

The informational requirements for the FAMS-C MIS model are based on:

1. Currently available information and procedures.
2. Information that will be available upon completion of FAMS-A and FAMS-B.
3. Information that will be available in AAFIF.
4. Information that is available in DFAMS.
5. The information obtained from the interviews.

The FAMS-C MIS model combined all areas that were identified as necessary for MAJCOMs to provide accurate capability

assessments through the Joint Reporting Structure and to effectively manage fuel operations throughout the Air Force.

Validation. This researcher validated the identified informational requirements for the FAMS-C MIS model against requirements developed by MAJCOM fuels representatives during the FAMS-C workshop held at SSC/SMSM Gunter AFB, 14-17 May 1990. The next chapter presents the results of the interviews.

IV. Results

Overview

This chapter presents a summary of the survey objective, the actual survey process, and evaluation of the survey data. The last section presents the validation of the requirements identified in the survey.

Objective

The objective of the information, identified in the survey, is to provide MAJCOM Fuels Offices with a management information system that includes all data necessary to perform their duties, as well as, eliminate superfluous data that delays transmission and limits or restricts expedience in analysis. MAJCOM Fuels Offices need to effectively perform operational and capability assessments. They are also required to efficiently manage petroleum products, liquid aviators oxygen, liquid nitrogen, mobile and installed refueling equipment, fuels personnel, and funding.

Process

The interviews, with the three individuals at the FAMS program office SSC/SMSM Gunter AFB AL, were accomplished on 14 and 15 February 1990. The interviews were conducted one-on-one and lasted approximately on and one-half hours each. While at the FAMS program office, the researcher conducted a historical review of all available PETROL RAM and FAMS

documents. PETROL RAM was the acronym for three base level fuels initiatives later incorporated into FAMS-B. These initial interviews, and the thorough review of the files, provided the researcher a solid background from which to preform the telephone interviews.

The telephone interviews with the MAJCOM Fuels Offices were performed during April 1990.. The interviews lasted, on average 45 minutes. The individuals interviewed had definite opinions on what needed to be changed and improved to allow them to perform their duties effectively. A majority of the informational requirements identified by one MAJCOM was identified by all MAJCOMs. There were a few command unique requirements, but most requirements were identified as lacking or outdated at all MAJCOMs.

The requirements, identified during the interview process with each MAJCOM and the SSC/SMSM, were sorted by type and function. Each requirement was evaluated, using available regulations, interviews, and personal knowledge, to determine if a requirement was likely to be command unique or applicable to all Air Force MAJCOM Fuels Offices. Finally, the informational requirements, as identified through the interview process, were segregated by function and evaluated against the objectives of the FAMS-C MIS.

Initial FAMS-C Requirements

The following is an outline of the informational items identified during the survey that are applicable to all Air Force MAJCOM Fuels Offices for day to day management, and capability and operational assessments.

Tables 1 and 2 are suggested formats for reporting and updating the identified data. With data assigned to specific blocks in a individual spreadsheet, it can then be easily accessed for overall consolidation in a master (command wide) spreadsheet.

I. All current Combat Fuels Management System data, to include the following:

A. Inventory data (DFX, MGX, JPX, LOX, LIN, and De-Icing Fluid)

1. Type product and stock number

2. Current quantity on-hand

3. Date last updated

B. Fuels Mobility Support Equipment and Storage Containers - Equipment and Status

1. Type servicing equipment - Fuel servicing modules (R-14s, R-25s, R-26s, ABFDS w & w/o ACE kits, R-22 Pumps, etc

2. Portable storage containers - bladders (four sizes) - 50,000, 20,000, 10,000, & 3,000 gallons

3. Sealed drums (two sizes) - 500 & 50 gallon

4. Status - Authorized, assigned, serviceable, deployed, deployable, and avg. in-commission rate

Table 1. Status - Fuels Mobility Support Equipment

Servicing Equipment						
Base-Luke Loc-Ariz Date-mm/dd/yy	R-14s	R-25s	R-26s	ABFDS w/ & w/o Ace Kits		R-22 Pumps
Authorized	12	14	5	11	4	8
Assigned	10	13	3	9	4	8
Serviceable	9	13	2	8	4	6
Deployed	2	0	0	4	1	1
Deployable	7	13	1	3	3	4
In Commission Avg Rate	93%	98%	90%	94%	95%	85%

(1:9-7)

Table 2. Bladders and Sealed Drums

Bladders					Sealed Drums		
	50,000 gal	20,000 gal	10000 gal	3000 gal		50 gal	500 gal
Authorized	10	15	10	17	O/H	350	20
Assigned	10	12	10	16			
Serviceable	9	10	10	15			
Deployed	0	2	0	4			
Deployable	9	8	10	11			

(1:9-7)

C. Status - Mobile Equipment - Air Force Owned

1. Authorized and assigned
2. Serviceable and deployed
3. Minimum number essential
4. Average in commission rate

5. Included equipment

a. Panto-graphs and hose carts

b. Refuelers and servicing vehicles

D. Status - Mobile Equipment - Contractor Owned

1. Number assigned in the following categories:

a. Aviation fuel - Ground fuel

(1) 0 - 3000 gallons

(2) 3000 - 8000 gallons

(3) greater than 8000 gallons

E. Status - Fixed Facilities

1. Planned and programmed projects

2. Significant work-orders

3. Type product and number of fillstands

a. Average output (300 or 600 gal per min)

b. Maximum number simultaneously used

c. Average number in commission

4. Hydrants

a. Type I, II, III, IV/hot pit

b. Gal/min (300.600,900, or 1200)

c. Number of pump houses and laterals

d. Total outlets and max simultaneous use

e. Average in commission and usage rates

5. Liquid oxygen and nitrogen tanks

a. Air Force or contractor owned

b. Authorized and assigned

c. Serviceable and deployed

d. Minimum essential and deployable

e. Average in-commission and capacity (400, 500, 2000, 5000, and > 50000 gallons)

6. Liquid oxygen generation plants

a. Authorized and assigned

b. Serviceable and in commission rate

c. Size (1.5 or 5 ton plant)

d. Availability of emergency power

7. Emergency power generators

a. Assigned, in-place, or not authorized

b. Location (storage, fuels control center, hydrants, hot pits, service station and fuels laboratory)

F. Personnel - AFSC 631X0

1. Authorized, assigned, and available

2. Number of personnel with the following special experience identifiers (SEI)

a. SEI 037 - LOX trained and qualified

b. SEI 039 - Quality control qualified

c. SEI 040 - Accountant, trained and qualified

d. SEI 369 - ABFDS trained and qualified

e. SEI 387 - ATHRS trained and qualified

G. Capabilities

1. Simultaneous hydrant refueling

a. Wide body aircraft

b. Narrow body aircraft

c. Fighter type aircraft

d. Truck turn around time

e. Base pipeline storage capacity

f. Demineralized water storage capacity

g. JPX-hot pit usable storage

h. Sustained flow rate into plane (gal/24hr)

i. Max receive flow rate (gal/24hr)

j. Max bulk storage transfer rate (gal/24hr)

k. Sustained bulk storage transfer rate (gal/24hr)

2. Bulk storage and hydrant usable capacity

a. Product (JPX, DFX, MGX)

b. Quantity in gallons

3. Demineralized water capability

a. Sustained service capability (gal/24hr)

b. Primary and secondary sources

c. Max receive rate or generation capacity

4. Receipt capabilities

a. Jet fuel receipt preference

(1) Pipeline

(2) Tank car (rail) and or tank truck

(3) Tanker/barge and or ocean tanker

b. Average jet fuel receipt rate (gal/24hr)

c. Sustained jet fuel receipt rate (gal/24hr)-primary mode

d. Sustained jet fuel receipt rate (gal/24hr)-all modes

5. Fuel off loading headers - receipt capability

a. Type product (JPX, MGX, DFX)

b. Number of headers per product, per receipt type (JPX by rail tanker, JPX by tank truck,etc)

6. Shipment capacity (primary)

a. Product and mode

b. Number of headers and gallons per min

7. Cryogenics LOX and LIN

a. Storage capacity (AF & contractor)

b. Storage capacity off base contractor

c. Procurement sources (primary & secondary)

d. Procurement lead times

e. Max. generation capacity (gal/24hr)

II. Insure all data bases are secure from intrusion

A. Insure only the owners of a data base can change data within the data base

B. Insure data is accessible (can be transferred) by using organizations

III. Access to FAMS-B data bases

A. Defense data network as primary communications link

B. Automatic update of FAMS-C (daily, weekly, monthly)

C. Provide MAJCOM ability to selectively access and upload data

D. Access base level emergency action plans

IV. Conductivity between MAJCOM FAMS-C data bases

A. Information on other MAJCOM bases (capability information) is required for planning

B. Current capability information is also required during implementation of an Oplan

V. Provide graphics support

A. Required to utilize the air field maps available in AAFIF MIS

B. Greatly improve ability to preform advanced planning

VI. Access to the Automated Air Facilities Files

A. Required for deployment planning and execution when infrequently used airfields are to be utilized

B. The Defense Mapping Agency produce the files with detailed data on 43000 airfields throughout the world

VII. Access FAMS-A data base

A. Historical data (month/year totals, cost)

B. Energy usage and conservation information

C. Consumption - Flying hour program

D. Contract information

VIII. Access Defense Fuels Supply Centers DFAMS

A. Access current ground fuels contract bulletins

B. Access data on availability and current contracts on JPX

IX. Improve the availability and timeliness of capability/operational data

A. Currently the data is two to four days old by the time the MAJCOM Fuels Office receives a copy

B. Make the data accessible at all times (within two to four hours)

X. Automate manually prepared reports

A. DD-A&L(A)506 Bulk Petroleum Storage Facilities Report (DOD4140.25M, Sec II, Ch 15)

1. Tankage information

a. Total capacity and unusable space

b. Tank characteristics (under/above ground, type construction, and status)

c. Shipping and receiving mode by tank

2. Storage facility profile (planned/programmed actions)

B. LOG-SA(AR)7144 Worldwide Petroleum Requirements (AFM 67-1, Vol I, Part Three, Ch 1)(3:79)

C. LOG-SA(SA)7308 Peacetime Operating Stock Computation for Aviation Fuels (AFM 67-1, Vol I, Part Three, Ch 1)(3:79)

D. LOG-SA(M)7149 Monthly Inventory Transaction Report (propellants) (AFM 67-1, Vol I, Part Three, Ch4)(3:79)

E. LOG-SA(SA)7150 Forecast of Propellant Requirements (AFM 67-1, Vol I, Part Three, Ch 4)(3:79)

F. LOG-SA(M)7151 Consolidation and Reporting of Sales (propellants) (AFM 67-1, Vol I, Part Three, Ch4)(3:79)

G. LOG-SA(AR)7152 Propellant Items Off Specification (AFM 67-1, Vol I, Part Three, Ch 4)(3:79)

XI. Status of war reserve materials

A. PWRMR - Prepositioned war reserve materiel requirements

B. PWRMS - Prepositioned war reserve materiel stock

C. WCDO - War consumable distribution objectives (required/on-hand)

XII. Provide E-mail capability between all FAMS data bases

XIII. Establish FAMS-C as the primary data base to feed fuels information to other data bases (CFMS, AFC2S, & DFAMS) (12,14,16,19,20,21,22,24,26,27)

The above requirements were identified during the initial interviews in February and April 1990. The requirements were validated using the 7 May 1990 FAMS-C Concept Document by Synergy Corp. and the minutes from the May 14-17th Fuels Automated Management System Command Level (FAMS-C) workshop.

Validation

The objective of the workshop was to determine requirements for FAMS-C. There were knowledgeable representatives from HQ Air Force LEYSF and LEXX, SA-ALC/SFX, SSC/SMSM, and

the following MAJCOMs: MAC, TAC, SAC, AFLC, AAC, USAFE, and PACAF. The workshop was held 14 - 17 May 1990 at the FAMS program office, SSC/SMSM, Gunter AFB. The workshop verified a list of potential requirements, which had been identified in a FAMS-C Concept Document by a contractor, Synergy Corp., as a baseline. They then identified additional requirements and how FAMS-C should be configured. See Appendix B for the Fuels Automated Management System Command Level (FAMS-C) Workshop Minutes.

The results of the initial survey were validated with the requirements identified and agreed upon at the workshop. All of the informational requirements identified in the initial survey were included in the final requirements determination. However, the workshop did not list requirements in as great a detail as this report. The working group identified areas of general requirements only. The workshop also identified several additional requirements not identified in the initial information requirements list. They include:

I. "Replace in Kind" transactions
   - A. Country and grade
   - B. Quantity and replacement number

II. Equipment/Vehicle Validations (TA's)
   - A. Basis of issue
   - B. Validation factors

III. Publications/Regulations
   - A. Tech data and CMALs

IV. Equipment

A. Hoses, nozzles, and couplers

B. Filter separators

V. Personnel

A. Manning work load factors

B. Training quotas

VI. Quality assurance

A. Area laboratories results

B. Base fuels laboratory results

C. Terminal storage results

(11:6-7)

Summary

This chapter discussed the objectives and processes of the interviews. The initial results of the informational requirement survey were listed. From these surveys, the researcher produced a listing of data elements applicable to MAJCOM Fuels Offices Air Force wide. In order to validate the identified data elements, a comparison was completed using the minutes from the Fuels Automated Management System Command Level (FAMS) Workshop Minutes. The conclusions, drawn from these results, are discussed in Chapter V.

V. Conclusions and Recommendations

Overview

This chapter presents the researcher's conclusions to the four investigative questions which drove this research project. Briefly, the questions concerned what the capabilities and specific data requirements of FAMS_C were. Also, given these data requirements and capabilities, what was the preferred mode of transmission and what associated MISs should be accessible to FAMS-C? The results obtained answered all of the investigative questions. This chapter concludes with recommendations for future study.

Conclusions to Investigative Questions

Investigative Question 1. What capabilities do MAJCOM fuels personnel desire in a computer based MIS? There are many desired features. First, the ability to create a comprehensive fuels and related informational data base at the MAJCOM Fuels Office was desired. This data base is to contain data from each individual Air Force base and operating location within the MAJCOM. The second feature was this data base would be kept current. The FAMS-C MIS would accomplish this by automatically accessing all assigned FAMS-B MISs nightly and updating information that had changed. The third feature requested was for consolidation of the individual base information on acquisition, distribu-

tion, and consumption. This information is used for planning, programming, and accounting by MAJCOM Fuels Offices. The fourth feature requested was to have the ability to access other major command FAMS-C data bases. This ability would be useful during contingency planning and implementation of operational plans. The specific data requirements is addressed next.

Investigative Question 2. What specific data is required for the FAMS-C data base? Categories of specific types of data are identified in Chapter IV. These categories of required data are listed under the following outline number: I, VI, VII, IX, and X. The categories contain all of the information that is currently be reported plus the automation of all manually prepared reports. Some of the areas currently being reported have been expanded to include data on systems not currently reported. An example is the inventory status and storage capacity of LOX and LIN tankage. The data required ranges from the physical inventories to the status on the current ground fuels contract. The next paragraph describes other MIS data bases which contain information the MAJCOM Fuels Offices uses in their work.

Investigative Question 3. What associated MIS access should be pursued? The MAJCOM Fuels Offices requested an interactive network be developed between FAMS-C and AFC2S, FAMS-A, DFAMS, NAVFAMS, AAFIF, other Air Force MAJCOM FAMS-C data bases, and to all the FAMS-B data bases within their

MAJCOM. See Figure 2 for a graphic depiction of the proposed FAMS-C MIS network.

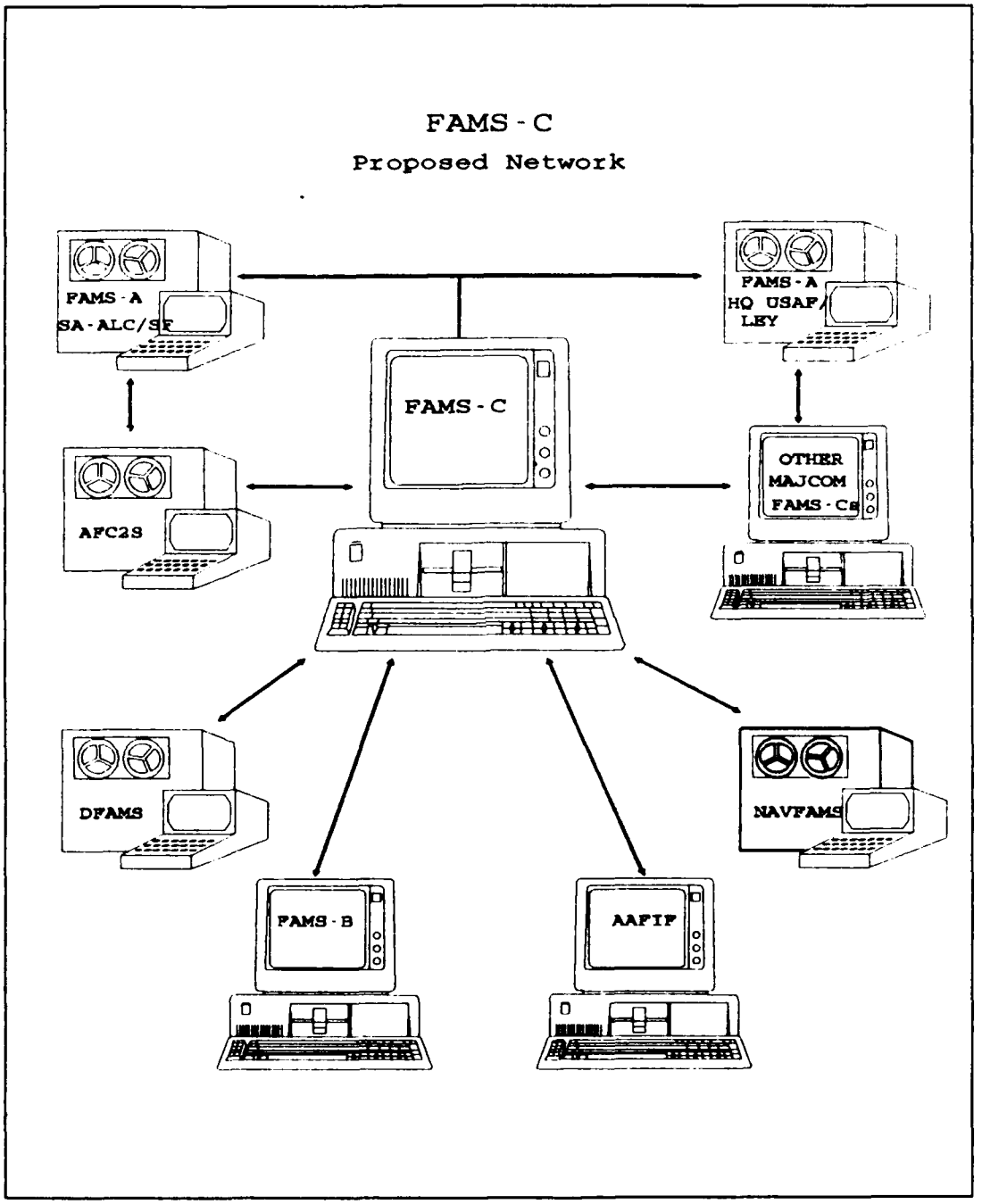


Figure 2. FAMS-C - Proposed Network

Access to these MISs will clearly improve the ability of MAJCOM Fuels Offices to perform their duties and it will significantly reduce the time currently spent gathering available data or data which will be available on these systems. The subsequent paragraph answers the fourth and final question.

Investigative Question 4. What medium of data transmission should be used and how often will FAMS-C be updated? There was a consensus on the primary mode to be used. The primary mode should be a dial-up line between the MAJCOM Fuels Office and the base FAMS-B computer. The Defense Data Network would most likely be used. The backup mode would consist of FAMS-B (local base fuels branch) sending data, in report format, through the SBSS 1100/60 computer to the base communication center for transmission through the AUTODIN system. AT MAJCOM, the base communications center would have the AUTODIN system transfer the data directly into the FAMS-C computer. The FAMS-C computer, at each MAJCOM, should contain the master fuels data base from which other MISs access fuels data.

Recommendations

The researcher, from personal experience and information gathered during the interviews, strongly recommends the programming for FAMS-C contain all of the features identified. The program for FAMS-C should also be open-ended,

that is, be able to have additional requirements added within the existing structure.

There also exists related areas for further research. Two of these areas for follow-on research are the need to develop base-level interfaces for the FAMS-B MIS and the second is to define the data requirements for FAMS-A.

The first area, related base-level MISs, is referring to justifying and developing interfaces with other computer based management systems. These systems contain data that have an effect on data within FAMS-B. An example of related MISs are the Core Automated Maintenance System (CAMS), the On-Line Vehicle Integrated Management System (OL-VIMS), Base Engineering Automated Management System (BEAMS), Base Contracting Automated System (BCAS), and Combat Supply System (CSS). Using a computer interface with these system the FAMS-B data base could be updated while on-line. Thus the status of ground fuel on order with estimated delivery information would be readily available (BCAS), and the status and funding of a civil engineering work-order would be readily available (BEAMS). With these interfaces FAMS-B would become a truly magnificent MIS.

The second recommended topic is to develop the requirements for FAMS-A, at both HQ USAF/LEYSF and SA-ALC/SF. Although both locations would have the same data base, the uses of the information is different. A survey of knowledgeable personnel at both locations, combined with a thorough literature review of the regulations detailing job

requirements, and a knowledge of available data sources would be an excellent start for a useful research project.

Summary

The technology to develop a MIS is not new and neither is the knowledge that a well designed MIS produces timely information in a format useful for decision making. The question this research attempted to answer was what information and what configuration does a well designed MIS for MAJCOM Fuels Offices require. Through use of Air Force regulations, personal and telephone interview, and personal knowledge, the researcher developed a comprehensive list of requirements for the FAMS-C MIS. The FAMS-C MIS will increase the ability of the Air Force to manage and account for over 3 billion in fuel resources annually.

Appendix A: Telephone Interview Questions (FAMS-C)

1. How is the base level information required for your job currently received? (CFMS, M-34, Telephone calls, etc.)

2. Do you require any of the following types of information, and if so, how often and in what format would it be most useful.

A. Product Inventory

B. Refueling Equipment Auth/On Hand
(Air Force, contractor)

D. WRM Equipment Auth/On Hand
(WCDO Levels, Bladders, Portable equip)

E. Fixed Facilities and their capabilities
(Fillstands, Hydrants)
(Bulk storage tanks, LOX/LIN tanks)

F. Personnel
(auth/Assign, skill level, special experience identifiers (ATHRS, ABFDS, etc.)

G. Issue/Receipts (PSO)
(to whom - A/C, AGE, Vehicles, Facilities)
(JPX, DFX, & MGX - Daily, Monthly, Annual)

3. Would the following types of information be useful if it could be obtained from SA-ALC? (How often - As Required, Monthly, Annually)

A. Consolidated issues

B. Flying program data

C. Energy conservation data

D. Other information you may require

4. Do you receive excess or redundant information, if so on what reports/systems?

5. What would be your recommendations for streamlining the reporting process to receive only the information you need when you need it?

6. Primary and secondary reporting electronic data systems.

A. AUTODIN - Base fuels computer > Sperry 1160 > communications center > etc.

B. DDN - Base fuels computer > MAJCOM computer

C. Which of the above should be the primary and secondary reporting systems?

7. Would the ability for MAJCOMs to access the base level fuels computer database be useful?

8. Should the reporting format be open-ended for command unique reporting requirements?

9.Would access to other MAJCOM's CFMS data be useful?

10. Are there any data bases that you are aware of that having access to would increase your efficiency and improve your management decisions?

Appendix B: Fuels Automated Management System Command Level (FAMS-C) Workshop Minutes

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON DC

From: LEYSF 5 July 1990

Subject: Fuels Automated Management System Command Level (FAMs-C) Workshop Minutes

To: See Distribution

1. Col Chevy Davis, director of Supply Systems for the Standard Systems Center, provided opening comments. He stressed the importance of functional personnel having an input in the definition of requirements for a system for which they are the ultimate customers. He provided insight on the level of effort expended to get FAMS to the point it is today. The outlook for the future is optimistic: the receipt of funds and manpower for the program will give us the opportunity to have a lasting impact on the career field with benefits into the 21st century.

2. Capt Overman, SSC/SMSMW, expressed his appreciation to the members of the work group for responding on such short notice. He stated that the presence of the representatives from the overseas commands indicated the widespread understanding of the importance of this project. He emphasized that we have an excellent opportunity to be drivers of the command level system.

3. Capt Overman stated that the objective of the work group was to provide a detailed requirements definition for the command fuels community. He also indicated that we, as a community, are required to take an active role in defining the fuels module of the Air Force Command and control system (AFC2S). It's to our advantage to do that smartly without creating redundancies between AFC2S and FAMS-c. The two systems should complement each other while providing the command fuels staff the tools they need to get the job done better and faster.

4. Mr. Lavin, HQ USAF/LEYSF, thanked everyone for attending. He stressed the need for the fuels community to be smart about how er do business. We haven't changed much since the 1950's and have fallen behind the times in modernizing our approach to the fuels business.

5. Mr. Lavin provided details on the documented benefits associated with the fielding of FAMS. He indicated that FAMS has been approved

by an Air Force Defense Management Review initiative, and that the civilian industry and sister services were watching our progress closely. He talked in some detail about the PETROL RAM projects and what the game plan was to field those systems. He closed by saying that we need to work together smartly with the AFC2S project management to ensure that scarce funds are wisely spent to get the system we need to do our jobs.

6. Mr John Lee, SSC/AQCR, provided a detailed briefing on AFC2S and, specifically, on the fuels module of AFC2S. His briefing gave background on the AFC2S program, Air Force Command and Control Modernization Methodology approach, and specifics on the CFMS module. He summarized by stating that we need to work together. The fuels community needs to identify who specifically will represent the community in identifying and reviewing FAMS requirements with the AFC2S program office.

7. Capt Overman laid the ground rules for the rest of the conference. The basic format was: brainstorm session to identify all requirements at a command level office; panel discussions to group and provide details about specific requirements; group session to recommend FAMS-C or AFC2S inclusion of these requirements.

8. CMSgt Wilber led the group in a command level requirements definition brainstorming session. The Synergy concept documents were used as a baseline. Group members identified new areas for consideration, and in some cases, expanded on areas previously identified. It was also determined that the data needed to be grouped as classified access or unclassified access, and indicated with source of the data. During this process, the group determined that there is a significant amount of non-standard data that is needed on an irregular basis, most of which should be accessed from the FAMS-B and FAMS-A data bases. Examples are identified in Atch 1.

9. The group also discussed the use of graphics in conjunction with the command system. While some of the Defense Mapping Agency systems and other AFC2S inputs come with sophisticated graphics, there is often a graphics requirement with the non-standard reports (e.g., energy conservation, hydrant utilization, etc.). The group concluded that a quality graphics package is required for command unique or non-standard reports.

10. The group agreed that the requirements defined in the Synergy concept document, when taken in conjunction with the Combat Fuels Management System (CFMS) and the new requirements in Atch 2, generally covered all know command requirements. It was agreed that this data should be passed back to Synergy to be compiled by: (1) major area; (2) data field; (3)data source(s); (4) classified, unclassified (or both) data base. The sum total of this information would then comprise the command fuels requirements definition.

11. Action item: HQ USAF/LEYS task Synergy to compile the final requirements definition to include the areas defined above.

12. Capt Overman then led a discussion to determine the scope of the systems requirements in terms of AFC2S vs FAMS-C. The general consensus was that all standard reporting elements be passed to AFC2S to be included in the fuels module of that system; this data should be grouped for classified or unclassified access. The fielding of the fuels module of AFC2S would effectively replace the current CFMS programs. This system would also provide access to such data as the WMP, AAFIF, FLAS, DFAMS, etc.

13. Non-standard data and reporting requirements would be handled by a management information system know as FAMS-C, which would interface with FAMS-A and FAMS-B to fulfill the requirement for data management of a non-routine and non-standard nature. This system would also support command unique requirements. See the graphic depiction (Atch 2).

14. Hardware requirements were also discussed. The group agreed that each MAJCOM and identified number Air Forces or separate operating agencies would require hardware/terminals to support classified and unclassified access to AFC2S on a routine basis. Current access to the MAJCOM system is very cumbersome and time consuming; AFC2S needs to improve on this by providing sufficient hardware to support MAJCOM requirements. FAMS-C hardware requirements, over and above the AFC2S requirements, would be identified and funded through FAMS.

15. Capt Overman provided closing remarks. He stated that the community was taking a big step forward by having functional personnel actively involved in the requirements definitions process. He said the key was to build a system smartly, efficiently, and economically, while still providing the fuels community with the tools to get the job done.

16. He reminded the group that the goal is to solve our problems before we automate, not to automate our problems.

M. RAYDE HARRINGTON, COL, USAF
Deputy Chief, Supply Fuels
Plans and Policy Division
Dir of Logistics Plans and Policy

3 Atch
1. Additional Requirements
2. System Graphic
3. Distribution List

ADDITIONAL COMMAND REQUIREMENTS

Area Data Fields	Source	Class	Unclas
Replacement in Kind (RIKS)	FAMS-B/A		x
County			x
Grade			x
Quantity			x
Rm #			x
Equip/Vehicle Validations (TA's)	FAMS-B		x
BOI's			x
Validation Factors			x
Inventory	FAMS-B/A		
Gain/Loss Data			x
Trend Analysis			x
Off Base Purchase			x
Energy Conservation			x
Capability Assessment Data	APC2S		
WMP 1		x	
WMP 2		x	
WMP 3		x	
WMP 4		x	
WMP 5		x	
FLAS		x	
Max 1-Day Rqmts		x	
OPLAN Bed Down		x	
Pubs/Regulations			x
Tech Data			x
CMALS			x
Blue Book			x
Rqmts Computations	FAMS-B +	x	x
PSO/APSO	Det 29	x	x
EDPs		x	x

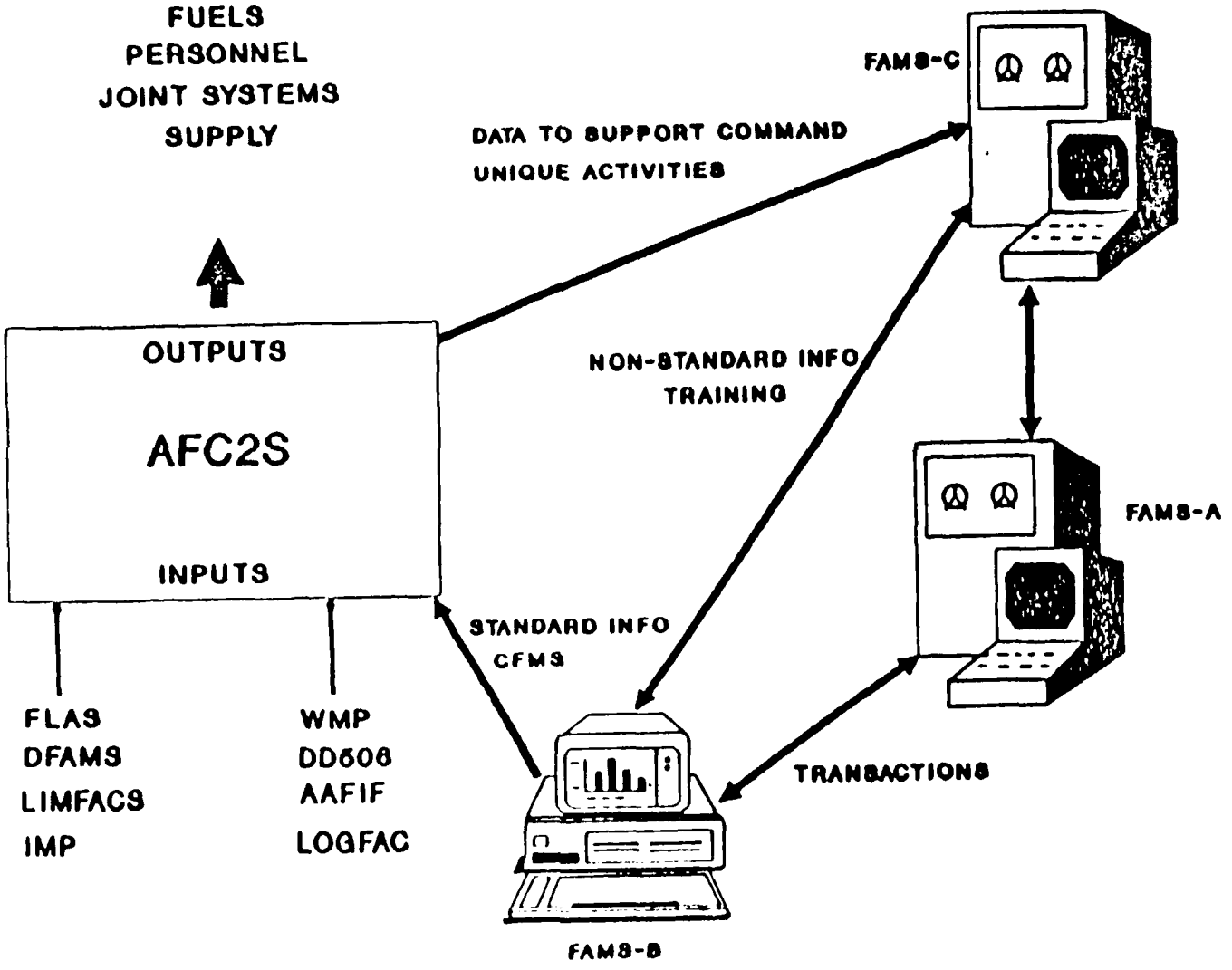
Atch 1

Area Data Fields	Source	Class	Unclas
Tanks	FAMS-B		x
Size	DD506		x
Type			x
Above/Below			x
Vapor Recovery System			x
Fire Surpression			x
Automated Tank Gauging			x
Date Inspected			x
Type Dikes			x
Leak Check Date			x
EPA Eval Date			x
Grade			x
Bulk Storage (by Grade)			x
Usable Capacity	APC2S		x
Shelf Capacity	DD506		x
Pipeline Quantity	AF 759/		x
Tank Bottoms	AF 761		x
Equipment	FAMS-B		
Hoses			x
Nozzles			x
Couplers			x
Filter Seps			x
Personnel:			
SEIs			x
PDS Codes	MAJCOM/DP		x
Training Quotas	MAJCOM MIS		x
Senior Personnel Moves	MAJCOM/DP		x
Blue Book	Det 29/SF		x
Work Load Factors			x
Air Field Data	APC2S +		
FLIPS (DMAP)	FAMS-A		x
Air Field (i.e. LAX, MGM)			x
Routing I.D.			x

A 1-2

Area Data Fields	Source	Class	Unclas
Quality Assurance	FAMS-A/B		x
Area Lab Results			x
Base Lab Results			x
Terminal Storage (QAR) Results			
Inventory (added)			
Overseas Rqmts	FAMS		x
Tanker Schedules (all data)	DFR, DFAMS		x
Purchase Programs	Det 29/DFR		x
Spot Buys	Det 29/DFR		x
Pending Rqmts	Det 29/DFR		x

A 1-3


FUELS
PERSONNEL
JOINT SYSTEMS
SUPPLY
DATA TO SUPPORT COMMAND
UNIQUE ACTIVITIES
FAMS-C
OUTPUTS
AFC2S
INPUTS
NON-STANDARD INFO
TRAINING
FAMS-A
STANDARD INFO
CFMS
TRANSACTIONS
FLAS
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Appendix C: Acronyms

AAFIF	Automated Air Facilities Information File
ABFDS	Aerial Bulk Fuel Delivery System
ACE	Alternate Capability Equipment for ABFDS
ADC/FDS	Automated Data Collection/Fuel Dispensing System
AFC2S	Air Force Command and Control System
AFSC	Air Force Specialty Code
ATG	Automated Tank Gaging
ATHRS	Air Transportable Hydrant Refueling System
CFMS	Combat Fuels Management System
CMALs	Control Multiple Address Letters
DDN	Defense Data Network
DFAMS	Defense Fuels Automated Management System
DFSC	Defense Fuels Supply Center
DFX	Diesel Fuel (all grades)
FAMS	Fuels Automated Management System
FAMS-A	Fuels Automated Management System (HQ USAF level)
FAMS-B	Fuels Automated Management System (base level)
FAMS-C	Fuels Automated Management System (MAJCOM level)
FCC	Fuels Control Center
JPX	Jet Fuel (all grades)
LOX	Liquid Aviators Oxygen
LIN	Liquid Nitrogen
MGX	Motor Vehicle Gasoline (all grades)
MAJCOM	Major Command

PWRMR	Prepositioned War Reserve Materiel Requirement
PWRMS	Prepositioned War Reserve Materiel Stock
SA-ALC/SF	San Antonio Air Logistics Center, Directorate of Energy Management
SBSS	Standard Base Supply System
SEI	Special Experience Identifier
SIOATH	Source Identification and Ordering Authorization
SSC	Standard Systems Center
SSC/SMSM	Standard Systems Center's Fuels Automation Management System Office
TAs	Table of Allowances
WCDO	War Consumable Distribution Objective
WWMCCS	Worldwide Military Command and Control System

Appendix D: Definitions

BLADDER - A large deployable collapsible container made of rubber or rubber like materiel used to store petroleum products.

BULK STORAGE - The section of base fuels branch that is responsible for the receipt, storage and issue of bulk quantities of liquid petroleum products.

COMBAT FUELS MANAGEMENT SYSTEM REPORT (D033) - A SBSS daily report to MAJCOM. The data is used for management of petroleum resources and contingency planning.

DEFUEL - The action taken to remove fuel from an aircraft. Normally performed to prepare an aircraft for maintenance.

Det 29, SA-ALC/SFM - A detachment of the Directorate of Energy Management. Det 29 performs centralized commodity management for items managed in the bulk petroleum fuels management category, fuels division, AF stock fund.

GROUND FUELS - Refined petroleum products normally intended for use in administrative, combat, and tactical vehicles; material handling equipment; special purpose vehicles; and stationary power and heating equipment.

HOT PIT - A refueling technique used to refuel an aircraft when one or more engines are idling.

HYDRANT SYSTEM - A permanently installed refueling pump system, located on the aircraft parking ramp, used to refuel aircraft.

JOINT REPORTING SYSTEM - An information system used for reporting information to HQ USAF and Joint Planning and Operation Offices.

MAJCOM FUELS OFFICE - The major command staff office that is responsible for tracking and coordinating fuel requirements, refuel equipment, and fuels personnel. They also develop plans and programs to support major command objectives.

MANAGEMENT INFORMATION SYSTEM - Data organized into a format to provide useful information to the user.

MODEM - Modulator/Demodulator. Electronic equipment used to transmit electronic data between two points.

MONTHLY FUELS MANAGEMENT DATA REPORT (M34) - A monthly report that provides cumulative totals for issues, defuels, receipts, shipments, inventory adjustments, and identity changes. SIOATH data is also provided.

PETROL RAM - An acronym for three separate projects, using electronic equipment, to modernized the way the base fuels branch accomplishes its various jobs. These projects will improve job safety and inventory accuracy. These projects were incorporated in to the overall frame-work of FAMS-B.

REFUEL - The action of filling an aircraft with fuel.

SERVICING EQUIPMENT - Any portable equipment used to refuel or defuel an aircraft. Types of equipment range from refueler trucks to hose carts.

SPECIAL EXPERIENCE IDENTIFIER - A code used by the Director of Personnel to identify personnel with special training and skills.

WAR CONSUMABLE DISTRIBUTION OBJECTIVE - A USAF document reflecting the PWRMS for consumable items.

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This study investigated the informational requirements for the Fuels Automated Management System - Command Level (FAMS-C). The areas of interest were: desired capabilities of the management information system (MIS), the specific data required to establish and maintain a current data base, what associated MIS access should be pursued, and the best mode for primary and secondary data transmission. Surveys (personal and telephone interviews) were conducted with individuals from the Standard Systems Centers (SSC) Fuels Management Office and personnel at the following MAJCOM Fuels Offices: SAC, TAC, MAC, ATC, and AFLC. The information gathered during the interviews was developed into an initial requirements list. This list was validated against the requirements identified at the Fuels Automated Management Systems - Command Level (FAMS-C) workshop held at SSC/SMSM in May 1990. Items identified in the initial survey were also identified during the workshop, however the workshop did not go into as great a detail as this report.

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